

SECTION 800 FINE AGGREGATE FOR USE IN PORTLAND CEMENT CONCRETE

800.1 GENERAL REQUIREMENTS

The fine aggregate shall consist of natural sand or, subject to approval, other inert materials with similar characteristics, or combinations having hard, strong, durable particles.

Fine aggregate from different sources shall not be mixed or stored in the same pile nor used alternately in the same class of construction or mix, without permission from the Engineer.

800.2 SPECIFIC REQUIREMENTS

- A. Deleterious Substances:** The amount of deleterious substances shall not exceed the following limits by dry weight:

Clay lumps.....	0.50%
Coal and lignite.....	0.25%
Shale and other materials having a specific gravity less than 1.95.....	1.00%
Other deleterious substances (such as alkali, mica, coated grains, soft and flaky particles).....	1.00%

The maximum amount of all deleterious substances listed above shall not exceed 2.00 percent by dry weight.

- B. Soundness:** When the fine aggregate is subjected to five cycles of the sodium sulfate soundness test, the weighted loss shall not exceed ten percent by weight.

When Class M (I) concrete fine aggregate is subjected to five cycles of the sodium sulfate soundness test, the weighted loss shall not exceed 12 percent by weight.

A satisfactory soundness record for deposits from which material has been used in concrete for five years or more, may be considered as a substitute for performing the sodium sulfate soundness test.

- C. Organic Impurities:** The fine aggregate shall be free from injurious amounts of organic impurities. Aggregates subjected to the colorimetric test for organic impurities and producing a color darker than the standard shall be rejected unless they pass the mortar strength test specified in Paragraph D.

Should the aggregate show a darker color than samples originally approved for the work, it shall not be used until tests have been made to determine whether the increased color is indicative of an injurious amount of deleterious substances.

- D. Mortar Making Properties:** When subjected to the test for mortar making properties, the fine aggregate shall develop a compressive strength at the age of three days when

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using Type III cement or at seven days when using Types I or II cement, of not less than 90 percent of the strength developed by a mortar prepared in the same manner with the same cement and graded Ottawa sand having a fineness modulus of 2.40 ± 0.10 .

- E. Grading:** Fine aggregate shall be well graded from coarse to fine and shall conform to the following gradation requirements:

Passing 3/8 inch (9.50 mm) sieve.....	100%
Passing No. 4 (4.75 mm) sieve.. ..	95-100%
Passing No. 16 (1.18 mm) sieve.....	45- 85%
Passing No. 50 (300F m) sieve.....	10- 30%
Passing No. 100 (150F m) sieve.....	2- 10%

Class M (I) concrete fine aggregate shall conform to the above gradation requirements except, the percent passing a No. 100 (150F m) sieve shall be from 0 to 10 percent.

The percentage of material passing the No. 200 (75F m) sieve shall be such that the composite mixture of fine and coarse aggregate will conform to Section 820.2.

Fine aggregate failing to pass the minimum requirement for material passing the No. 50 (300F m) or the No.100 (150F m) sieve may be used provided a satisfactory inorganic fine material is added during production to correct for the deficiency in gradation.

- F. Uniformity of Grading:** The gradation requirements given in Section 800.2 E. represent the extreme limits which shall determine suitability for use from all sources of supply. The gradation from any source shall be reasonably uniform and not subject to the extreme percentages of gradation specified above. For the purpose of determining the degree of uniformity, a fineness modulus shall be made upon representative samples from sources proposed for use. Fine aggregate from any source having a variation in fineness modulus greater than 0.2 either way from a representative sample may be rejected.

The uniformity of grading requirements do not apply to fine aggregate for Class M (I) concrete.

- G. Sampling and Testing:**

Sampling.....	SD 201
Gradation.....	SD 202
Shale.....	SD 208
Soundness Test (Sodium Sulfate Solution, five cycles).....	SD 220
Organic Impurities.....	AASHTO T 21
Clay Lumps.....	AASHTO T 112
Uniformity of Grading (Fineness Modulus).....	AASHTO M 6